TEXAS AGRICULTURAL EXPERIMENT STATIONS.

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Chemical Section—July, 1907.

Commercial Fertilizers and Poisonous Insecticides in 1906-7.

BY

G. S. FRAPS, Chemist.

POSTOFFICE

COLLEGE STATION, BRAZOS COUNTY, TEXAS.

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NOTE—*The main station is located on the grounds of the Agricultural and Mechanical College, in Brazos County. The postoffice address is College Station, Texas. Reports and bulletins are sent free upon application to the Director.*

TABLE OF CONTENTS.

COMMERCIAL FERTILIZERS AND POISONOUS INSECTICIDES IN 1906-7.

G. S. FRAPS.

The amount of commercial fertilizers used in Texas is comparatively small. The amount is increasing and may be expected to increase yearly. The quantity sold in Texas in 1905-06 was 13,500 tons. In 1906-07 it was 19,200 tons, this being an increase of 42 per cent. This does not include cottonseed meal.

THE FERTILIZER AND INSECTICIDE LAW.

Under the law of this State, all poisonous insecticides and all fertilizers, including bat guano, nitrate of soda, muriate of potash, and sulphate of potash, as well as mixed fertilizers, must carry on each package sold, or offered for sale, a tag bearing the analysis of the fertilizer or poisonous insecticide above the signature of the State Chemist. To expose or offer for sale any package of fertilizer or poisonous insecticide without this tag is a direct violation of the law. Dealers in fertilizers should see that all goods they receive are properly tagged; they violate the law in selling or offering for sale any untagged fertilizer, or poisonous insecticide.

ANALYSES FOR CONSUMERS.

The State law also provides that any agriculturalist or farmer may take a sample of any commercial fertilizer or poisonous insecticide, and have analysis made free of charge, under rules and regulations prescribed by the State Chemist.

The regulations adopted are given below. Their object is to make certain that a fair sample of the fertilizer has been sent for analysis. No sample of fertilizer will be analyzed until the State Chemist is satisfied that it represents the goods from which it was taken. It is not easy to take a fair sample of a fertilizer, and the analysis of an unrepresentative sample would be just to neither the manufacturer or consumer, and might possibly work an injustice to one or the other. We wish to emphasize this statement: *No free analysis of fertilizers or insecticides will be made until we are satisfied that the sample is a fair representative of the goods.*

The following regulations have been adopted:

DIRECTIONS FOR SAMPLING.

In the presence of a disinterested party select about five pounds from the top, middle and bottom of at least three sacks of the fertilizer; mix these nine samples carefully, take from the mixture at least one pound, and send by prepaid express in a sealed can or jar, to "State Chemist, College Station, Texas." *Be sure to place your name and address on the package.* If the sample was not taken as described, give a statement as to how it was taken.

Fill out a certificate in the following form, and send it by mail to the State Chemist. Blank forms will be furnished by the State Chemist upon application, but if desired the form may be copied out on a sheet of paper.

I hereby certify that the sample of fertilizer (or poison) known and sold as ..... *was bought by me of* ..... *Texas,*

(Name of Brand)

(Dealer's Name and Address)

.....

(Date of Purchase)

and that it represents fairly, the quality of the fertilizer (or poison) delivered to me and that the sample was taken according to the prescribed instructions, or as described on the back of this blank.

It is sold at $..... *per ton cash.*

I further certify that I am not a dealer in or agent for any fertilizer sold in this State.

Sign .....

Date .....

Address .....

.....

I hereby certify that I witnessed, as a disinterested pearty, th taking of the above named sample by Mr. .....
and that it was taken as described. I believe it represents fairly the goods bought by him.

Sign .....

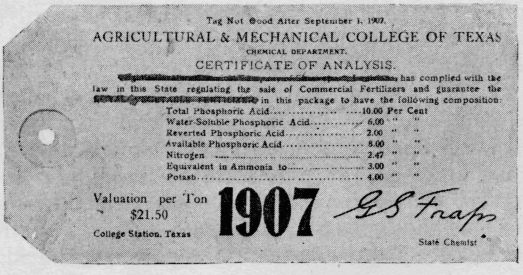
Date .....

Address .....

.....

FORM OF TAG.

As has been stated, every package of fertilizer sold in Texas should carry a tag showing its chemical composition, and bearing the signature of the State Chemist. The following is an example of the tag used in 1906-7:


Tag Not Good After September 1, 1907.

AGRICULTURAL & MECHANICAL COLLEGE OF TEXAS

CHEMICAL DEPARTMENT.

CERTIFICATE OF ANALYSIS.

[redacted] has complied with the law in this State regulating the sale of Commercial Fertilizers and guarantee the [redacted] in this package to have the following composition:

Total Phosphoric Acid	10.00 Per Cent
Water-Soluble Phosphoric Acid	6.00 " "
Reverted Phosphoric Acid	2.00 " "
Available Phosphoric Acid	8.00 " "
Nitrogen	2.47 " "
Equivalent in Ammonia to	3.00 " "
Potash	4.00 " "

Valuation per Ton $21.50

College Station, Texas

1907

G S Fraps

State Chemist

EXPLANATION OF TERMS.

The object of a fertilizer is to supply plant food to the soil in such forms that the plant can take it up easily. It thus supplements the available plant food of the soil and increases the crop if the soil does not provide enough plant food. The essential constituents of a fertilizer are phosphoric acid, nitrogen and potash, for these are the forms of plant food which may be needed. The other constituents of the fertilizer are, in part, necessary to carry the phosphoric acid, potash or nitrogen, or they are admixed with the ingredients used. Phosphoric acid in fertilizers is always accompanied by lime, or more correctly, is held in chemical combination with it. Potash is always combined with sulphuric acid or hydrochloric acid. Nitrogen is always combined with several things, and it is necessary for the purpose of a fertilizer that this should be so, for nitrogen by itself is a gas, and cannot be utilized as plant food by cotton, corn, sugar cane and similar plants, though it may be utilized by some leguminosae (cow peas, alfalfa, etc.) if the proper bacteria are present.

PHOSPHORIC ACID.

This is present in fertilizers in three forms: Water soluble, total and reverted.

Water-soluble phosphoric acid dissolves easily in water, and is easily taken up by plants. It is combined with lime. In the soil it is changed so that it is no longer water-soluble, still it can be taken up easily by plants.

Reverted phosphoric acid is combined with twice as much lime as water-soluble phosphoric acid. It does not dissolve in water, but is soluble in a solution of ammonium citrate. Reverted phosphoric acid is easily taken up by plants, and is generally supposed to have the same value as water-soluble phosphoric acid.

Available phosphoric acid is the sum of the water-soluble and the reverted phosphoric acid, and is so termed because plants can easily take it up, and thus it is available for their use.

Insoluble phosphoric acid is combined with three times as much lime as the water-soluble. It is taken up by plants very slowly indeed. In many States, as in Texas, it is given no value in a commercial fertilizer. In other States it is given a low value.

Total phosphoric acid is the sum of the water-soluble, the reverted and the insoluble phosphoric acid.

Acid phosphates are made by treating bones or mineral phosphates, in which the phosphoric acid is insoluble, with sulphuric acid. The sulphuric acid takes lime away from the insoluble phosphates, thereby producing the water-soluble and reverted phosphoric acid. Acid phosphate usually contains much more water-soluble phosphoric acid than reverted.

Bones are sold on their content of total phosphoric acid and nitrogen. Most of the phosphoric acid is present in the insoluble form, but on account of the organic matter present, it becomes available to plants more rapidly than the phosphoric acid of phosphate rock. The finer the bone is ground, the more easily plants can secure its phosphoric acid.

NITROGEN.

Nitrogen is present in a fertilizer as nitrate of soda, sulphate of ammonia, or in organic forms of combination, such as cottonseed meal, dried blood, tankage, bat guano, etc., or combinations of these. Nitrate of soda is easily taken up by plants, and easily washed from the soil. Ammonia is fixed by the soil, and hence is not washed out. Organic nitrogen is converted into ammonia or nitrates before it is taken up. The different forms of organic nitrogen have different values according to the extent and rapidity with which this change can take place.

The chief sources of nitrogen in Texas fertilizers are cottonseed meal, tankage, bat guano, nitrate of soda, and dried blood. Texas cottonseed meal contains 7 to 8 per cent nitrogen, with nearly 3 per cent phosphoric acid and 1.5 per cent potash. Nitrate of soda should contain 15 per cent nitrogen.

POTASH.

Potash is present in fertilizers as the sulphate or chloride of potash. The sulphate is considered the best form for potatoes and tobacco, as the chlorine in the chloride appears to make the potatoes less mealy, and the tobacco too moist.

Muriate of potash and *sulphate of potash* contain about 50 per cent of potash. Kainit contains 12 per cent potash.

VALUATION OF FERTILIZERS.

The valuation of fertilizer ingredients is, as nearly as can be estimated, the figure at which the respective ingredients can be bought at retail for cash in the large markets, in raw materials, unmixed. The valuation of a fertilizer does not represent its proper selling price at the point of consumption, nor its agricultural value. The cost of a ton of fertilizer, after mixing, is made up as follows: Cost of the material used in the mixture; cost of transportation; cost of mixing. In addition the expense of selling and the mixer's profit are included in the selling price. The valuation it fixed at the beginning of the season and remains constant,while the markes price of fertilizer ingredients is subject to fluctuations. For the reason given, fertilizer usually sells at a price above its commercial *valuation*. For example, in Vermont, the average selling price for mixed fertilizers varied from $8.05 to $11.36 in excess of the valuation, in ten years. In Connecticut the difference between the selling price and valuation in 1905 was about $9.00. The difference between valuation and selling price of fertilizer sold in Texas is discussed on the next page.

The commercial valuation is of value, as it aids one to compare several brands. But the needs of the soil, or of the crops to be grown, should never be left out of consideration, with exclusive consideration of the *valuation*. That is to say, the purchaser should consider the composition of the fertilizer very carefully, as well as its valuation.

FERTILIZER VALUATIONS 1906-7.

The following valuations have been adopted for commercial fertilizers in Texas for the seasons of 1906-7:

	Cents per pound.
Nitrogen in mixed fertilizers and bat guano	16 c
Available phosphoric acid in mixing fertilizers, bat guano and tankage	6 c
Potash in mixed fertilizers	5 c
Potash in muriate	5 c
Potash in sulphate	5½c
Total phosphoric acid in bone	4 c
Total nitrogen in bone and tankage	12 c

The average cash selling price and valuation of mixed fertilizer found on the Texas market during the season of 1905-6 and 1906-7 are given in the table following.

	Season 1905 6	1906-7
Average selling price	$26.15	$25.81
Average valuation	20.83	19.75
Difference	5.32	6.06

The difference between valuation and selling price represents the cost of mixing, bagging, freight, manufacturer's and dealer's profits, etc. The difference between valuation and selling price varies in different parts of the State, being greatly influenced by freight rates. The greatest differences between valuation and selling price were $14.40 above and 20c below valuation. There have been found differences of as much as seven dollars in the selling price of the same brand of fertilizers in different places.

There is apparently an increase in the difference between 1905-6 and 1906-7. In 1906-7 a larger number of brands (70) entered into the calculation than during the previous season.

The average difference between selling price and valuation of unmixed materials was found to be as follows:

	1905-6	1906-7
Acid phosphate per ton	$ 3.80	$ 3.00
Kainit per ton	8.00	7.85
Sulphate and muriate of potash, per ton	20.00	20.00

Excepting acid phosphate these materials were on hand only in small lots and limited in distribution.

EFFECT OF KEEPING ON COMPOSITION OF FERTILIZERS.

We have had a number of inquiries as to the loss of value in fertilizers kept for a year in a dry place. In order to secure definite information in regard to the point, we have determined the water-soluble and insoluble

phosphoric acid in twelve samples of fertilizer kept for two years in sample bottles. These samples represent the goods of nine manufacturers, and are mostly mixed fertilizers. The results are given in the table.

There is in some cases an increase in the insoluble phosphoric acid, in others a decrease. The average is a decrease of .08 per cent. The maximum decrease is 0.67 per cent, or, on the basis of 6c a pound, a maximum decrease of 84 cents per ton in the value of the fertilizer. Therefore the decrease in the value of the fertilizer on keeping in a dry place, is slight, if any. Of course if the fertilizer were exposed to rain or became very moist, the differences would be greater. These samples were kept dry during the entire period of their preservation.

PHOSPHORIC ACID OF FERTILIZERS IN 1905 & 1907.

Laboratory No.		Water-Soluble Phosphoric Acid. 1905	1907	Insoluble Phosphoric Acid. 1905	1907
66	Capital Bone and Potash Compound	1.47	1.09	2.25	2.56
77	Vegetable Special	6.40	6.35	.32	.99
51	Blood, Bone and Potash	6.60	6.05	1.27	1.22
45	Caddo Cotton	5.90	5.94	.52	.52
17	Meridian HomeMixture	8.20	7.22	1.24	.99
116	Texas Pride Soluble Guano	6.07	6.45	.28	.37
79	African Cotton Grower	7.07	6.81	.33	.82
73	Primo H. G. Raw Bone Superphosphate	7.47	7.11	.17	.50
62	Scott's Gossipium Phospho Special	6.27	6.27	1.44	1.51
50	Vegetable Grower	5.65	5.69	1.02	.75
37	Dissolved Bone and Potash	8.15	6.87	.52	.61
33	Acid Phosphate	11.54	10.16	1.87	1.34
	Average	6.73	6.33	.94	1.02
	Maximum difference	+1.38			+.67
	Minimum difference	—.37			—.53

Samples represent 9 manufacturers, mostly mixed goods.

APPLICATION OF FERTILIZERS.

The most profitable fertilizer to apply depends upon the character of the soil and the kind of crops to be grown. The previous treatment to which the soil has been subjected is also of decided influence. There are such variations in soils that each user of fertilizers must, to a large extent, be guided by his own experience. Based on the fertilizer experiments which have been made, and knowledge of the composition and properties of soils suggestions for the fertilizers to be applied to different crops in

different localities may be made, and the application of fertilizers as suggested will prove profitable in many cases, if judgment is used. More profitable results, however, may be often produced with a somewhat different formula, and it is in this respect that the experience of the individual must be applied. The best results with fertilizers are obtained when thorough cultivation is given.

The user of fertilizer should distinguish between a large increase of crop and a profitable increase. With many crops it is possible to increase the crop by increasing the amount of fertilizer, but beyond a certain point, the increase in crop is no longer profitable. That is to say, the additional amount of crop secured does not pay for the additional quantity of fertilizer used. The point at which the addition of fertilizer ceases to be profitable depends upon the selling price of the crop. Crops of high selling price per acre will of course bear a larger profit from larger applications of fertilizer than crops selling at a low price per acre.

The following table from a bulletin of the Tennessee Experiment Station shows how the cost of the additional crop may be increased by the additional fertilizer:

EXPERIMENT ON POTATOES.

Total Quantity of Fertilizer Used per acre.	Additional Quantity of Fertilizer	Additional Crop Secured	Cost Fertilizer for each Additional Bushel Increase
0 lbs.	0 lbs.	———	———
250 lbs.	250 lbs.	30.3 Bu.	$0.15
500 lbs.	250 lbs.	15.5 "	0.60
1000 lbs.	500 lbs.	11.3 "	1.13
1500 lbs.	500 lbs.	4.1 "	2.25

The first 250 pounds of fertilizer secured 30.3 bushels more potatoes at a cost of 15c per bushel for fertilizer. The last 500 lbs. of fertilizer secured 4.1 bushels at a cost of $2.25 per bushel for fertilizer.

FERTILIZERS FOR COTTON.

Fertilizer for cotton should be applied in the row, about a week before planting, and in such a way that the seed, when planted, will not come in direct contact with it. To secure the best results the land should be cultivated thoroughly.

Three kinds of fertilizers are used for cotton: Cottonseed meal, acid phosphate, and mixed fertilizers.

Cottonseed Meal, at the rate of 200 lbs. per acre, gives good results on some sandy soils which need nitrogen. Its application alone to bottom lands, or anywhere that cotton has a rank growth, is not to be advised.

Acid Phosphate, at the rate of 200 lbs. per acre, is peculiarly suited to many bottom lands, and many black prairie lands. Many of these soils have an abundant supply of nitrogen, but are deficient in phosphoric acid, and the application of acid phosphate gives excellent results. Acid phosphate is sometimes sticky, and not easily applied by a drill for this reason.

The Mixed Fertilizers used for cotton and corn are usually what is termed 8-2-2 goods, or approach this composition. That is they contain

8 per cent available phosphoric acid, 2 per cent potash, and 2 per cent ammonia (equal to 1.65 per cent nitrogen). They are rich in phosphoric acid, and contain smaller quantities of potash and nitrogen.

Fertilizers of this kind are of benefit to land which responds to acid phosphate. They are generally beneficial to upland soils, not black prairie. If in the proper degree of fineness, they are easily applied with a drill, and for this reason are sometimes preferred to acid phosphate, which, as has been stated, is sometimes sticky and not easily applied. The amount used is 200 lbs. per acre.

FERTILIZERS FOR CORN.

The same fertilizer is applied to corn as to cotton. Corn responds readily to phosphoric acid. It is able to utilize barn yard manure better than cotton.

FERTILIZERS FOR RICE.

The maintenance of the fertility of rice soils has been discussed in Bulletin 82 of this Station. Phosphoric acid appears to be needed by most of our rice soils, or will be needed in a short time. The applicaton of acid phosphate at the rate of 100 lbs. per acre has given an increase of 2 or 3 sacks per acre on Louisiana soils.

Potash appears to be deficient in the Orange County soil, and the other soils will become deficient if the practice of burning the straw and allowing the ashes to waste continues. The straw contains considerable potash.

For soils deficient in potash a fertilizer containing phosphoric acid and potash should be applied.

FERTILIZERS FOR POTATOES.

Some of the Texas potato soils need potash, while others require very little at present. Until the different kinds of soils are studied it is impossible to say which need potash and which do not. They all appear to need phosphoric acid.

For soils which do not need potash, a mixture of equal parts cottonseed meal and acid phosphate should give good results. Apply 300 lbs. per acre, in the row, and so that the fertilizer does not come in direct contact with the plant. The mixture would be improved if a part of the cottonseed meal were replaced by half as much nitrate of soda. Nitrate of soda is a quick acting fertilizer, and would aid in giving the plant an early start.

For soils deficient in potash, the potato fertilizer should contain 3 to 4 per cent of nitrogen, 6 to 8 per cent phosphoric acid, and 4 to 8 per cent potash. The exact composition of the fertilizer to give the best results depends upon the nature of the soil. A fertilizer containing 3 per cent nitrogen, 8 per cent phosphoric acid and 4 per cent potash is a good fertilizer for many Texas soils requiring potash. Apply 300 to 400 pounds per acre.

In the potato growing sections of the North where large yields are secured, large quantities of fertilizers are used, but the early potatoes grown in this State are comparatively light yielders.

FERTILIZER RECIPES.

During the season of 1906-7 we found it necessary to issue another warning against the purchase of fertilizer recipes.

When you purchase a recipe for making fertilizers, you are parting with your money for *nothing*. We have seen several of these recipes, and have yet to see one that was not worthless. The mixtures prepared according to the directions given are not worth the time and labor applied. Ingredients are called for which can only be purchased at a drug store at high prices, and, likely as not, are of no more value to the plants than a piece of coal would be.

But even if you did happen to buy good directions for mixing a fertilizer —what then? You have paid your money for something that could be secured for nothing. The Experiment Station will at any time send without charge, directions for mixing any kind of fertilizer desired.

Bnt, as said before, we have never yet seen a fertilizer recipe sold for $5.00 or any other price, that was not worthless.

Do not buy fertilizer recipes.

The fertilizer formula which has been sold in the State is as follows, or some variation of this:

2 lbs. bluestone,
2 lbs. saltpeter,
2 lbs. nitrate of ammonia,
2 lbs. soda ash,
4 lbs. potash ball.

Dissolve in 5 gallons of water and sprinkle on sand, make a ton, sufficient for one acre.

Not a single one of the substances mentioned is used in making fertilizers. Bluestone and soda have no value as fertilizers. Saltpeter, ammonium nitrate and potash contain potash and nitrogen, but they are too expensive to use as fertilizers. Besides, the "potash" would act on the ammonium nitrate and drive off the ammonia. The above ingredients would contain about 3 pounds potash and 1 pound nitrogen, with a fertilizing value of 31c. In other words, the purchaser of this recipe pays his money to learn how to get 31c worth of fertility fot $1.50 or $2.00. Applied to one acre of land, the mixture would have practically no effect on the crop and would merely lead to disappointment. Three dead cats and a bucket of wood ashes would be of greater benefit.

Farmers are warned against the purchase of recipes for making fertilizers, particularly if they are claimed to be "secret" or "wonderful discoveries." Numbers of these recipes have been sold in different parts of the country at from $2.00 to $5.00 or more. As a rule, they are of no value. The Experiment Station, at College Station, will furnish free of charge correct formulas for the mixing of fertilizers for cotton, corn, potatoes, or anp other crop, to any farmer in the State. Do not purchase recipes, when correct formulas can be had for nothing, particularly when the recipes that you buy will probably cause waste of time and money in the preparation of mixtures which are of little value, and disappointment in the crop produced.

HOME MIXTURES.

Whether or not it will be profitable for the farmers of Texas to do their own mixing depends upon several conditions, and varies in different parts of the State. One should calculate how much acid phosphate, cotton seed meal, kainit, nitrate of soda, or muriate of sulphate of potash would be required to make a ton of the fertilizer of the composition desired, and then calculate the cost of these ingredients. One could then ascertain how much a ton of similar fertilizer could be purchased for, and judge whether or not it would pay to make the mixture.

Acid phosphate and cottonseed meal can be easily obtained in this State. Kainit is sold in a number of places, while nitrate of soda, and muriate, or sulphate of potash are less easily secured. A complete fertilizer can be made by mixing cottonseed meal, acid phosphate, and kainit.

A complete fertilizer is made by mixing (a) ingredients which carry phosphoric acid, (b) those which carry nitrogen, (c) those which carry potash.

Phosphoric acid is supplied as acid phosphate. Acid phosphate is made by treating bones or phosphate rock with sulphuric acid. Freight rates on sulphuric acid are high, on account of its dangerous nature, and it will not pay to buy sulphuric acid and treat bones at home. Bones and phosphate rock contain phosphoric acid united with so much lime that plants can not take it but slowly. The sulphuric acid removes a portion of the lime, so that acid phosphate contains phosphoric acid easily taken up by plants, termed available phosphoric acid. Three grades of acid phosphate are on the market, with 12, 14, or 16 per cent available phosphoric acid respectively.

One hundred pounds 16 per cent acid phosphate contains as much phosphoric acid as 114 pounds 14 per cent, or 133 pounds of 12 per cent acid phosphate.

Nitrogen can be supplied by cottonseed meal, or nitrate of soda. One hundred pounds nitrate of soda contains as much nitrogen as 214 pounds cottonseed meal. Cottonseed meal contains some phosphoric acid and potash also. The more hulls the meal contains, the lower its value for fertilizing purposes. Fertilizer manufacturers can use tankage, bat guano, or dried blood as sources of nitrogen, in addition to nitrate of soda or cottonseed meal.

Potash is supplied by kainit or muriate or sulphate of potash. One hundred pounds of muriate or sulphate of potash contains as much shopta as 400 pounds kainit. Potash is also contained in wood ashes, rice warts ashes, and cottonseed hull ashes, but these cannot be used in mixed fertilizers, as they affect the phosphoric acid injuriously.

To make the mixture, weigh out the acid phosphate on a clean floor, add the cottonseed meal and kainit, breaking up any lumps that appear. Then two men with shovels may shovel the mixture back and forth, transferring it from one pile to another, and breaking up any lumps with the back of the shovel, until all is thoroughly mixed.

Cotton and Corn Fertilizer—A cotton and corn fertilizer containing 8 per cent available phosphoric acid, 2 per cent potash, and 1.65 per cent nitrogen may be made by mixing:

1150 pounds acid phosphate 14 per cent
480 pounds cottonseed meal,
330 pounds kainit,
40 pounds dirt.

2000 pounds.

With acid phosphate at $20.00, Kainit at $20.00, and cottonseed meal at $24.00 a ton respectively, the ingredients for this mixture will cost (at retail) $20.10.

A Potato Fertilizer containing 8 per cent available phosphoric acid, 3 per cent nitrogen and 4 per cent potash may be made by mixing:

1100 pounds acid phosphate, 14 per cent,
160 pounds muriate or sulphate of potash,
200 pounds nitrate of soda,
430 pounds cottonseed meal,
110 pounds dirt.

2000 pounds.

With the same prices for acid phosphate and cottonseed meal as in the above mixture, and with nitrate of soda and muriate of potash at $70.00 a ton, the ingredients for this mixture would cost (at retail) $28.33.

In place of the nitrate of soda, 430 more pounds cottonseed meal may be used, and the dirt left out. We then have 2120 pounds and the composition is not exactly that given, but larger quantities may be used. This would reduce the cost of the fertilizer to $26.06 for the 2120 pounds. It is advisable to use some nitrate of soda.

A Potato Fertilizer containing 8 per cent phosphoric acid, 3.1 per cent nitrogen and no potash, may be made by mixing 1100 pounds acid phosphate and 900 pounds cottonseed meal.

If ony other formulas are desired, they can be secured on application to the Chemist of the Experiment Station, College Station, Texas.

We have calculated the cost of the ingredients for six more fertilizers. Using cottonseed meal at $25.00 per ton, kainit at $20.00, and 14 per cent acid phosphate at $20.00 per ton, the ingredients for six fertilizers cost on an average of $3.38 per ton less than the selling price of the corresponding mixed fertilizers. The difference is greater for some fertilizers than for others, being indeed very small in some cases. The cost of mixing should be included by those who intend to mix. If the ingredients for the mixtures are purchased in large quantities, that is, at wholesale, they of course cost less.

BAT GUANO.

We have had several inquiries in regard to the composition of bat guano. The following table gives the composition of a number of samples:

COMPOSITION OF BAT GUANO.

	Phosphoric Acid Available. Per Cent.	Nitrogen. Per Cent.
I	.92	3.93
II	7.70	6.28
III	5.00	9.94
IV	6.07	5.38
V	4.10	10.06
VI	5.08	1.66
VII	3.97	6.49
VIII	2.97	11.55
IX	4.12	11.44
X	2.02	8 67

POISONOUS INSECTICIDES.

All poisonous insecticides are subject to the same regulations as commercial fertilizers, and must carry a label showing the composition thereof, with the signature of the State Chemist. The sale of any poisonous insecticides without this label is in violation of law.

The insecticides registered under the law for the season 1906-7 are as follows:

A. B. Ansbacher, New York, N. Y.
Paris Green.

James Bute, Houston, Texas,
Paris Green.
London Purple.

Benj. Hammond, Fishkill-on-Hudson, N. Y.,
Slug Shot.

Fred L. Lavanburg, New York, N. Y.,
Paris Green.

I. Pfeiffer, New York, N. Y.,
Paris Green.

The insecticide season begins May 1.

ANALYSES OF FERTILIZERS SEASON 1906-7.

The following tables contain (a) the guaranteed composition of the fertilizers sold in Texas; (b) the analysis of the sample sent by the manufacturer; (c) the analysis of samples sent in by consumers (farmers sample); and (d) the analysis of samples collected by the inspector (inspector's sample).

The relation between valuation and guarantee during the last two seasons is as follows:

	Season 1905-6	1906-7
Average valuation of inspector's samples	$22.49	$20.58*
Average valuation guaranteed	20.62	19.12
Average excess furnished	1.87	1.46

Most of the analytical work here reported was done by Mr. S. E. Asbury, Assistant State Chemist. Practically all the nitrogen determinations were made by Mr. J. T. Cruse.

*Average of 88 Brands

Laboratory Number	Manufacturer, Place of Business, and Brand	Phosphoric Acid: Available Per Cent	Phosphoric Acid: Total Per Cent	Nitrogen Per Cent	Potash Per Cent	Valuation
	Arkansas Fertilizer Co., Little Rock, Ark.					
....	White Diamond Ammoniated Bone Superphosphate—guarantee	11.53	16.50	1.76	.56	$20.03
597	Manufacturer's sample	11.53	16.50	1.76	.56	20.03
671	Inspector's sample	9.61	12.39	1.56	1.98	18.50
779	Inspector's sample	9.37	13.49	1.52	1.72	17.82
....	White Diamond Twentieth Century Fertilizer—guarantee	10.39	14.20	1.92	.90	19.51
598	Manufacturer's sample	10.39	14.20	1.92	.90	19.51
707	Inspector's sample	8.68	14.09	1.44	1.70	16.73
....	White Diamond Nitrated Superphosphate, with Potash—guarantee	10.38	13.19	2.64	1.39	22.30
599	Manufacturer's sample	10.38	13.19	2 64	1.39	22.30
751	Farmer's sample	7.97	11.05	2.56	2.71	20.46
717	Inspector's sample	9.60	14.50	2.26	4.06	22.81
783	Inspector's sample	7.89	11.10	2.48	2.65	20.06
....	White Diamond Kali Superphosphate—guarantee	13.86	15.45	.....	.59	17.22
601	Manufacturer's sample	13.86	15.45	.....	.59	17.22
734	Inspector's sample	10 96	15.64	.....	1.91	15.06
....	White Diamond Acid Phosphate—guarantee	14.00	16.00	.....	.....	16.80
600	Manufacturer's sample	15.26	16.85	.....	.....	18.31
704	Inspector's sample	11.66	16.36	.....	.....	13.99
....	White Diamond Orchard Fertilizer—guarantee	10.00	12.00	.64	6.00	20.07
728	Manufacturer's sample	11.74	14.47	1.08	6.35	23.89
670	Inspector's sample	10.43	14.47	1.42	4.12	21.18
	Armour Fertilizer Works, Chicago, Illinois.					
....	All Soluble—guarantee	8.00	9.00	2.88	4.00	$22.82
500	Manufacturer's sample	8.88	9.82	3.28	4.97	26.18
....	Armour's Potato Fertilizer—guarantee	10.00	11.00	2.47	6.00	25.90
487	Manufacturer's sample	11.09	12.06	2.80	7.22	29.49
662	Inspector's sample	12.03	12.19	2.56	7.19	29.82
....	Helmet Brand Pure Fine Ground Beef Bone—guarantee	.....	24.00	2.47	.....	24.93
775	Manufacturer's sample	.....	26.09	2.96	.....	27.97
....	Soluble Phosphate and Potash—guarantee	10.00	12.00	.....	4.00	16.00
502	Manufacturer's sample	10.26	10.77	.....	5.27	17.58
658	Inspector's sample	12.09	11.88	.....	4.18	18.44
....	African Cotton Grower—guarantee	9.00	10.00	2.47	3.00	21.70
493	Manufacturer's sample	9.92	11.39	2.80	4.00	24.86
....	Corn and Cotton Grower—guarantee	8.00	9.00	.82	1.00	13.22
489	Manufacturer's sample	9.40	10.35	1.56	2.47	18.44
696	Inspector's sample	7.65	8.47	1.10	2.21	14.91
....	Armour's Truck Special—guarantee	7.00	8.00	4.11	6.00	27.55
498	Manufacturer's sample	9.16	10.12	4.36	6.22	31.16
714	Inspector's sample	9.45	10.70	4.12	6.25	30.77
....	King Cotton—Guarantee	8.00	9.00	1.65	2.00	16.88
503	Manufacturer's sample	9.10	10.22	2.30	3.80	22.08
731	Inspector's sample	10.48	11.29	2.14	1.65	21.08
....	Phosphate and Potash—guarantee	10.00	11.00	.....	2.00	14.00
488	Manufacturer's sample	11.25	11.75	.....	2.56	16.06
724	Inspector's sample	11.97	12.77	.....	1.83	16.19
....	Texas Vegetable Grower—guarantee	9.00	10.00	2.05	3.00	20.36
496	Manufacturer's sample	9.75	11.09	2.48	4.12	23.76

Laboratory Number	Manufacturer, Place of Business, and Brand	Phosphoric Acid		Nitrogen Per Cent	Potash Per Cent	Valuation
		Available Per Cent	Total Per Cent			
732	Inspector's sample	10.66	11.57	2.26	4.19	24.21
....	Star Phosphate—guarantee	14.00	16.00	.....	.....	16.80
492	Manufacturer's sample	15.29	15.79	.....	.....	18.35
738	Inspector's sample	15.61	16.19	.....	.....	18.73
....	Raw Bone Meal—guarantee	.....	22.00	3.70	.....	26.48
628	Manufacturer's sample	.....	23.89	4.06	.....	28.85
	A. L. Brooks, Jacksonville, Texas.					
....	Acme Tomato Special—guarantee	10.34	10.63	3.19	1.14	$23.76
645	Manufacturer's sample	10.34	10.63	3.19	1.14	23.76
672	Inspector's sample	10.65	10.92	2.98	.55	22.93
	Caddo Fertilizer Co., Shreveport, La.					
....	Potash Acid—guarantee	10.00	11.00	.....	2.00	14.00
543	Manufacturer's sample	10.36	10.76	.....	1.80	14.21
....	Star—guarantee	10.00	11.00	1.65	1.50	18.78
544	Manufacturer's sample	12.02	12.39	1.97	1.53	22.25
661	Inspector's sample	9.01	9.70	2.08	1.74	19.21
762	Inspector's sample	8.89	10.19	1.78	1.59	17.96
....	Acid Phosphate—guarantee	14.00	15.00	.....	.....	16.80
545	Manufacturer's sample	15.64	16.25	.....	.....	18.77
669	Inspector's sample	14.01	15.60	.....	.....	16.81
781	Inspector's sample	14.51	16.36	.....	.....	17.41
...	Caddo Special—guarantee	6.00	7.00	2.50	7.00	22.20
546	Manufacturer's sample	7.36	7.67	2.94	7.20	25.44
676	Inspector's sample	8.15	8.64	2.40	6 13	23.59
778	Inspector's sample	6.83	7.52	2.12	5.25	20 26
....	Nitrate of Soda—guarantee	.....	.....	15.00	.....	48.00
547	Manufacturer's sample	.....	.....	14.84	.....	47.49
....	Caddo Corn—guarantee	6.00	7.00	2.90	1.00	17.48
548	Manufacturer's sample	7.42	7.82	3.50	1.39	21.49
739	Inspector's sample	10.19	10.70	2.30	1.43	21.02
....	Caddo Cotton—guarantee	8.00	9.00	2.05	1.00	17.16
550	Manufacturer's sample	9.59	10.06	2.37	1.31	20.40
709	Inspector's sample	8.58	9.30	1.90	1.22	17.59
....	Kainit—guarantee	.....	.....	.....	12.00	12.00
622	Manufacturer's sample	.....	.....	.....	13.44	13.44
720	Inspector's sample	.....	.....	.....	12.24	12.24
....	Caddo Vegetable—guarantee	8.00	9.00	3.30	4.00	24.16
551	Manufacturer's sample	8.76	9.34	3.00	5.74	25.85
718	Inspector's sample	10.06	10.96	3.36	3.52	26.34
766	Inspector's sample	9.77	10.14	2.94	3.77	24.90
....	Mur'ate of Potash—guarantee	.....	.....	.....	50.00	50.00
552	Manufacturer's sample	.....	.....	.....	53.43	53.43
	East Texas Fertilizer Co., Tyler, Texas.					
....	Tyler Acid Phosphate—guarantee	14.00	15.00	.....	.....	$16.80
636	Manufacturer's sample	14.61	16.61	.....	.....	17.53
....	Texas Vegetable and Fruit Grower—guarantee	10.75	11.00	2.50	2.25	23.15
612	Manufacturer's sample	11.02	11.26	2.54	4.56	25.91
....	Morrill Truck Special—guarantee	10.00	10.25	2.20	8.00	27.04
613	Manufacturer's sample	10.30	10.47	2.22	8.54	28.00
....	East Texas Crop Grower—guarantee	10.00	10.25	2.74	3.00	23.77
614	Manufacturer's sample	10.53	10.70	2.74	3.77	25.19
679	Inspector's sample	6.53	7.26	3.57	3.52	22 82
756	Inspector's sample	6.60	7.15	4.46	3.10	25.29

Laboratory Number	Manufacturer, Place of Business, and Brand	Phosphoric Acid		Nitrogen Per Cent	Potash Per Cent	Valuation
		Available Per Cent	Total Per Cent			
...	Cotton Special—guarantee	10.00	10.25	2.00	2.00	20.40
615	Manufacturer's sample	11.09	11.26	2.12	3.59	23.68
655	Inspector's sample	10.80	11.57	2.18	3.09	23.03
...	Kainit—guarantee	.....	.....	.....	12.00	12.00
631	Manufacturer's sample	.....	.....	.....	13.08	13.08
736	Inspector's sample	.....	.....	.....	13.14	13.14
...	Muriate of Potash—guarantee	.....	.....	.....	49.55	49.55
729	Manufacturer's sample	.....	.....	.....	49.55	49.55
...	Corn and Cotton Grower—guarantee	8.00	9.00	2.00	2.00	18.00
616	Manufacturer's sample	9.28	9.45	2.25	2.87	21.22
...	Tomato Special—guarantee	11.00	11.50	2.00	.40	20.00
617	Manufacturer's sample	11.21	11.42	2.86	.46	23.06
737	Inspector's sample	10.24	10.84	3.76	.74	25.06
...	Tyler High Grade Acid Phosphate—guarantee	16.00	17.00	.....	.....	19.20
619	Manufacturer's sample	16.15	16.40	.....	.....	19.38
695	Inspector's sample	18.18	19.04	.....	.....	21.82
721	Inspector's sample	16.99	18.11	.....	.....	20.38
652	Farmer's sample	16.99	17.64	.....	.....	20.39
	Farmers and Merchants Cotton Oil and Manufacturing Co., Mt. Pleasant, Texas.					
...	Mt. Pleasant Cotton and Corn Grower—guarantee	7.55	8.00	2.27	2.89	19.21
594	Manufacturer's sample	9.17	9.42	2.48	2.54	21.48
713	Inspector's sample	6.48	6.79	2.46	2.07	17.72
	Fidelity Cotton Oil and Fertilizer Co., Houston, Texas.					
...	Fidelity Acid Phosphate—guarantee	14.00	16.00	.....	.....	$16.80
608	Manufacturer's sample	14.56	15.16	.....	.....	17.47
634	Inspector's sample	14.61	15.22	.....	.....	17.53
659	Inspector's sample	15.95	16.35	.....	.....	19.14
776	Inspector's sample	14.78	14.97	.....	.....	17.74
...	Fidelity Kainit—guarantee	.....	.....	.....	12.00	12.00
755	Manufacturer's sample	.....	.....	.....	12.72	12.72
750	Inspector's sample	.....	.....	.....	12.42	12.42
...	Fidelity Royal Compound—guarantee	10.00	11.00	.....	4.00	16.00
511	Manufacturer's sample	10.55	11.47	.....	3 80	16.46
726	Inspector's sample	15.54	15.85	.....	.20	18.72
...	Fidelity Rice Planter—guarantee	12.00	12.20	.....	2.00	16.40
576	Manufacturer's sample	12.73	13.60	.....	2.04	17.32
677	Inspector's sample	13.76	14.12	.....	2.18	18.69
749	Inspector's sample	13.91	14.54	.....	2.29	18.98
...	Fidelity Sulphate of Potash—guarantee	.....	.....	.....	48.00	52.80
648	Manufacturer's sample	.....	.....	.....	49.70	54.67
...	Fidelity Cane Special—guarantee	8.00	9.00	3.30	3.00	23.16
653	Manufacturer's sample	8.77	9.04	3.54	3.04	24.89
...	Fidelity Cotton Special—guarantee	10.00	11.00	1.65	2.00	19.28
578	Manufacturer's samples	11.53	12.11	1.92	2.56	22.54
733	Inspector's sample	10.98	11.29	1.62	2.41	20.76
...	Fidelity Cotton Standard—guarantee	8.00	9.00	2.06	1.50	17.69
573	Manufacturer's sample	8.76	9.04	2.82	3.72	23.14
665	Inspector's sample	9.19	9.35	2.20	1.18	19.95
769	Inspector's sample	9.05	9.56	2.40	1.88	20.42
...	Fidelity Potato Special—guarantee	7.00	8.00	2.06	3.00	17.99
574	Manufacturer's sample	9 80	10.24	2.66	2.81	23.08

Laboratory Number	Manufacturer, Place of Business, and Brand	Phosphoric Acid		Nitrogen Per Cent	Potash Per Cent	Valuation
		Available Per Cent	Total Per Cent			
682	Inspector's sample	8.64	9.01	2.20	3.40	20.80
768	Inspector's sample	7.83	8.00	2.26	3.36	19.99
...	Fidelity Cereal Cultivator—guarantee	6.00	7.00	2.47	1.00	16.10
575	Manufacturer's sample	7.78	8.07	3.16	1.93	21.38
711	Inspector's sample	7.26	7.54	2.76	1.63	19.15
647	Farmer's sample	7.10	7.72	2.76	1.68	19.03
...	Fidelity Truck Grower—guarantee	8.00	9.00	2.47	8.00	25.50
579	Manufacturer's sample	9.08	9.52	2.82	8.21	28.13
710	Inspector's sample	10.28	12.33	2.34	5.94	25.76
770	Inspector's sample	8.83	9.05	2.66	8.12	27.23
...	Fidelity Peerless Trucker—guarantee	8.00	9.00	2.47	5.00	22.50
580	Manufacturer's sample	9.31	9.75	2.87	5.66	26.01
...	Fidelity Lone Star Special guarantee	10.10	11.00	1.65	6.00	23.28
572	Manufacturer's sample	11.16	11.67	1.90	6.15	25.62
...	Fidelity Strawberry Special—guarantee	6.00	6.50	2.47	5.00	20.10
577	Manufacturer's sample	7.42	7.77	3.12	6.15	25.03
746	Inspector's sample	7.66	7.87	2.34	5.08	21.77
	Gulport Cotton Oil Fertilizer and Manufacturing Co., Gulfport, Mississippi.					
...	Primo Muriate of Potash—guarantee				50.00	$50.00
525	Manufacturer's sample				54.24	54.24
...	Primo Sulphate of Potash—guarantee				50.00	55.00
526	Manufacturer's sample				52.80	58.08
747	Inspector's sample				47.37	52.10
...	Primo Standard Acid Phosphate and Potash—guarantee	10.00	11.50		2.00	14.00
527	Manufacturer's sample	9.27	9.90		2.22	13.34
...	Primo High Grade Acid Phosphate and Potash—guarantee	10.00	11.50		4.00	16.00
523	Manufacturer's sample	9.46	9.62		4.47	15.97
...	Primo High Grade Blood and Bone—guarantee	10.00	11.00	1.65	2.00	19.28
581	Manufacturer's sample	9.76	10.84	1.90	2.55	20.34
...	Primo Raw Ground Bone—guarantee		20.00	3.00		23.20
584	Manufacturer's sample		22.15	3.20		25.40
...	Primo Standard Acid Phosphate—guarantee	12.00	13.00			14.40
582	Manufacturer's sample	12.43	12.99			14.92
...	Primo Nitrate Soda—guarantee			15.00		48.00
583	Manufacturer's sample			15.36		49.15
...	Primo High Grade Acid Phosphate—guarantee	16.00	17.00			19.20
649	Manufacturer's sample	16.29	18.21			19.55
748	Inspector's sample	15.59	16.94			18.71
...	Primo High Grade Acid Phosphate—guarantee	14.00	15.00			16.80
524	Manufacturer's sample	14.21	14.69			17.05
644	Inspector's sample	15.18	16.22			18.21
...	Primo High Grade Vegetable Grower—guarantee	6.00	7.00	3.00	5.00	21.80
602	Manufacturer's sample	6.21	6.52	3.92	5.54	25.53
745	Inspector's sample	6.29	6.81	3.34	5.69	23.93
...	Primo Standard Cotton Seed Meal Compound—guarantee	8.00	9.00	1.65	2.00	16.88
530	Manufacturer's sample	8.58	8.84	2.08	2.43	19.38
753	Inspector's sample	8.76	9.27	2.02	2.02	18.99
...	Primo Standard Raw Bone Superphosphate—guarantee	8.00	9.00	1.65	2.00	16.88

Laboratory Number	Manufacturer, Place of Business, and Brand	Phosphoric Acid		Nitrogen Per Cent	Potash Per Cent	Valuation
		Available Per Cent	Total Per Cent			
529	Manufacturer's sample	8.58	9.55	2.04	2.46	19.29
678	Inspector's sample	9.91	10.75	1.82	1.90	19.61
....	Primo German Kainit—guarantee	.....	.....	.....	12.00	12.00
531	Manufacturer's sample	.....	.....	.....	12.16	12.16
	Hillje Bros., Weimar, Texas.					
....	H. B. W.—guarantee	8.00	9.00	2.00	2.00	18.00
627	Manufacturer's sample	8.89	9.87	2.10	2.54	19.93
	Houston County Oil Mill and Manufacturing Co., Crockett, Texas.					
....	Crockett Vegetable Producer—guarantee	8.00	8.50	3.50	5.90	26.70
620	Manufacturer's sample	8.45	8.67	3.66	6.04	27.89
730	Inspector's sample	6.30	8.60	3.80	5.66	25.38
....	Crockett Phospho Special—guarantee	13.25	13.50	1.50	1.50	22.20
626	Manufacturer's sample	13.64	14.06	1.54	1.69	22.99
680	Inspector's sample	9.58	13.44	1.52	1.77	18.13
....	Crockett Grower—guarantee	12.00	12.50	2.25	3.00	24.60
625	Manufacturer's sample	12.37	12.61	2 26	3.09	25.16
667	Inspector's sample	10.18	10.85	2.50	3.08	23.29
	Huntsville Cotton Oil Co., Huntsville, Texas.					
....	Huntsville High Grade—guarantee	10.00	11.00	2.00	2.50	20.90
624	Manufacturer's sample	10.08	11.45	2.08	2.63	21.39
740	Inspector's sample	10.01	11.36	2.00	3.02	21.43
	Jacksonville Cotton Oil Co., Jacksonville, Texas.					
....	Jacksonville Cherokee Standard—guarantee	10.00	10.50	1.90	1.65	$19.73
605	Manufacturer's sample	10.36	10.90	1.90	1.66	20.17
697	Inspector's sample	9.43	10.20	2.18	2.76	21.05
....	Jacksonville Vegetable Grower—guarantee	9.00	9.25	2.70	5.23	24.67
606	Manufacturer's sample	9.18	9.42	2.70	5.23	24.89
685	Inspector's sample	8.31	9.07	2.98	5.07	24.58
764	Inspector's sample	8.10	8.42	3.16	4.37	24.20
....	Jacksonville G. & H. Special—guarantee	11.39	11.97	2.88	.57	23.46
607	Manufacturer's sample	11.39	11.97	2.88	.57	23.46
673	Inspector's sample	9.84	10.96	2.94	.62	21.84
771	Inspector's sample	10 37	11.46	2.84	.58	22.11
....	Nitrate of Soda—guarantee	.....	.....	15.25	.....	48.80
637	Manufacturer's sample	.....	.....	15.25	.....	48.80
	Longview Cotton Oil Co., Longview, Texas.					
....	Longview Corn and Cotton Grower—guarantee	9.00	9.50	1.65	2.00	18.08
596	Manufacturer's sample	9.25	10.22	2.32	2.46	20.98
725	Inspector's sample	8.69	12.12	2.12	1.36	18.57
777	Inspector's sample	7.96	11.20	1.80	2.37	17.68
	John Marbach, New Braunfels, Texas.					
....	Crude Bat Guano—guarantee	2.00	2.50	10.15	.....	34.40
483	Manufacturer's sample	3.27	3.29	10.89	.....	38.77
....	Compost of Bat Guano—guarantee	6.00	8.96	4.94	1.00	24.01
553	Manufacturer's sample	6.40	8.96	7.83	1.59	34.33
	Meridian Fertilizer Factory, Meridian, Miss.					
....	Meridian Home Mixture—guarantee	10.00	10.50	1.65	1.50	$18.78
568	Manufacturer's sample	10.52	11.74	1.92	2.29	21.05
719	Inspector's sample	11.48	12.35	1.66	1.46	21.54
....	Meridian Blood and Bone—guarantee	10.00	10.50	1.65	1.00	18.28
567	Manufacturer's sample	10.34	11.65	1.82	2.08	20.31

Laboratory Number	Manufacturer, Place of Business, and Brand	Phosphoric Acid		Nitrogen Per Cent	Potash Per Cent	Valuation
		Available Per Cent	Total Per Cent			
656	Inspector's sample	9.66	10.61	2.16	1.79	20.29
...	Meridian Vegetable Grower—guarantee	8.00	9.00	2.50	5.00	22.60
569	Manufacturer's sample	8.77	10.91	2.88	6.00	25.74
...	Meridian Special Tomato—guarantee	8.00	9.00	2.50	1.00	18.60
570	Manufacturer's sample	11.45	12.72	2.23	1.43	22.31
712	Inspector's sample	13.53	13.84	3.08	.99	27.07
...	Meridian Southern Acid Phosphate—guarantee	14.00	15.00	.....	.....	16.80
630	Manufacturer's sample	15.43	16.65	.....	.....	18.52
664	Inspector's sample	13.94	15.60	.....	.....	16.73
669	Inspector's sample	12.99	15.27	.....	.....	15 59
...	Cabbage Special—guarantee	8.00	9.00	5.35	6.50	33.22
621	Manufacturer's sample	9.15	9.37	5.94	6.26	36.25
	New Orleans Acid & Fertilizer Co. of New-Orleans, La.					
...	Crescent City Acid Phosphate—guarantee	12.00	12.30	.....	.....	$14.40
480	Manufacturer's sample	12.97	13.91	.....	.....	15.56
...	Black Diamond Acid Phosphate—guarantee	12.00	12.30	.....	.....	14.40
478	Manufacturer's sample	14.97	15.57	.....	.....	17.96
692	Inspector's sample	13.74	14.72	.....	.....	16.49
...	Vegetable Grower—guarantee	6.00	6.20	2.47	4.00	19.10
479	Manufacturer's sample	6.74	6.95	2.66	4.00	20.60
722	Inspector's sample	5.39	5.86	2.82	4.50	19.49
...	Blood, Bone and Potash—guarantee	9.00	9.20	1.65	1.50	17.58
477	Manufacturer's sample	9.44	10.09	2.10	1.73	19.78
708	Inspector's sample	10.34	11.71	2.12	1.38	20.56
780	Inspector's sample	8.80	9.51	2.06	2.01	19.16
...	Muriate of Potash—guarantee	.....	.....	.....	50.00	50.00
609	Manufacturer's sample	.....	.....	.....	52.50	52.50
...	Kainit—guarantee	.....	.....	.....	12.00	12.00
611	Manufacturer's sample	.....	.....	.....	12.98	12.98
...	Economizer—guarantee	10.00	10.20	1.65	2.00	19.28
603	Manufacturer's sample	12.19	12.36	1.96	2.42	23.32
...	High Grade Acid Phosphate—guarantee	16.00	16.50	.....	.....	19.20
604	Manufacturer's sample	17.19	17.70	.....	.....	20.63
...	Nitrate of Soda—guarantee	.....	.....	14.00	.....	44.80
610	Manufacturer's sample	.....	.....	15.88	.....	50.82
...	Dissolved Bone and Potash—guarantee	10.00	10.30	.....	2.00	14.00
482	Manufacturer's sample	9.68	10.02	.....	2.00	13.65
...	Goldsmith's Improved Mixture—guarantee	9.00	9.20	1.65	1.50	17.58
481	Manufacturer's sample	9.48	9.74	1.70	1.84	18.66
686	Inspector's sample	10.18	11.09	1.70	1.43	19.09
716	Inspector's sample	7.98	8.85	1.65	2.16	17.12
752	Inspector's sample	7.98	8.71	1.88	1.67	17.27
	The H. Schumacher Oil Works, Navasota, Texas.					
...	Texas Staple Fertilizer—guarantee	8.86	9.04	2.75	3.40	$22.83
638	Manufacturer's sample	8.86	9.04	2.75	3.40	22.83
666	Inspector's sample	10.02	10.20	2.28	2.86	22.18
	Standard Guano & Chemical Manufacturing Co., New Orleans, La.					
...	Standard High Grade Sugar Fertilizer—guarantee	10.00	10.20	2.50	2.00	$22.00
640	Manufacturer's sample	10.98	12.90	2.82	2.27	24.47
521	Manufacturer's sample	.....	24.07	3.17	.....	26.87

Laboratory Number	Manufacturer, Place of Business, and Brand	Phosphoric Acid		Nitrogen Per Cent	Potash Per Cent	Valuation
		Available Per Cent	Total Per Cent			
....	Special Formula—guarantee	8.00	9.00	2.48	5.00	22.54
639	Manufacturer's sample	8.81	10.65	3.25	5.15	26.17
....	Standard Vegetable Fertilizer—guarantee	6.00	7.00	2.50	5.00	20.20
593	Manufacturer's sample	7.12	7.96	2.78	5.63	23.07
657	Inspector's sample	7.70	11.12	2.88	5.53	23.99
....	Standard High Grade Truck Grower—guarantee	8.00	8.20	3.50	7.00	27.80
505	Manufacturer's sample	10.36	11.24	3.90	7.32	32.23
....	Stern's Ammoniated Raw Bone Superphosphate—guarantee	9.50	9.70	1.65	1.50	18.18
517	Manufacturer's sample	11.08	13.16	1.96	1.69	21.15
688	Inspector's sample	10.35	11.52	1.76	1.72	19.77
....	Ground Bone and Potash—guarantee	.....	15.00	2.75	3.00	23.80
506	Manufacturer's sample	.....	16.45	3.22	3.43	24.32
....	"Kainit"—guarantee	.....	.....	.....	12.00	12.00
519	Manufacturer's sample	.....	.....	.....	12.26	12.26
698	Inspector's sample	.....	.....	.....	12.66	12.66
....	Standard Blood, Bone and Meat Fertilizer—guarantee	9.50	9.70	1.65	1.50	18.18
515	Manufacturer's sample	11.04	12.94	2.72	2.24	24.19
....	Mississippi Home Guano—guarantee	9.50	9.70	1.65	1.50	18.18
512	Manufacturer's sample	10.25	11.62	1.84	2.01	20.20
....	Standard Ammoniated Soluble Guano—guarantee	9.50	9.70	1.65	1.50	1.18
518	Manufacturer's sample	11.35	13.24	2.06	1.73	21.94
....	High Grade Acid Phosphate and Potash—guarantee	12.00	12.00	.....	2.00	16.40
510	Manufacturer's sample	14.31	15.10	.....	2.13	19.30
....	Acid Phosphate and Potash—guarantee	10.00	10.20	.....	2.00	14.00
508	Manufacturer's sample	12.01	13.47	.....	2.49	16.90
....	Stern's Acid Phosphate—guarantee	14.00	14.50	.....	.....	16.80
513	Manufacturer's sample	17.12	18.06	.....	.....	20.54
....	Muriate of Potash—guarantee	.....	.....	.....	45.00	45.00
520	Manufacturer's sample	.....	.....	.....	45.90	45.90
....	Standard Raw Bone Rice Fertilizer—guarantee	9.50	9.70	1.65	1.50	18.18
516	Manufacturer's sample	11.31	13.51	1.98	1.63	21.54
....	Dissolved Bone and Potash—guarantee	10.00	10.20	.....	4.00	16.00
509	Manufacturer's sample	12.26	12.97	.....	4.36	19.07
....	Sulphate of Potash—guarantee	.....	.....	.....	47.00	51.70
511	Manufacturer's sample	.....	.....	.....	50.00	55.00
....	Champion Farmers' Choice—guarantee	9.50	9.70	1.65	1.00	17.68
507	Manufacturer's sample	11.80	12.30	2.08	1.29	22.11
702	Inspector's sample	11.36	13.22	1.48	1.53	19.90
	Swift & Co., Chicago, Ill.					
....	Swift's Superphosphate—guarantee	8.00	10.00	1.64	2.00	$16.85
591	Manufacturer's sample	9.63	11.27	1.94	2.56	20.33
690	Inspector's sample	**7.06**	13.80	1.94	2.28	16.96
767	Inspector's sample	**6.47**	14.24	2.19	2.57	17.34
....	Swift's Champion Vegetable and Tobacco Grower	8.00	10.00	3.28	3.00	23.10
641	Manufacturer's sample	8.66	10.65	3.32	3.00	24.01
674	Inspector's sample	9 29	10.85	3.22	2.92	24.37
....	Swift's Special Vegetable Fertilizer—guarantee	8.00	10.00	2.05	6.00	22.16
588	Manufacturer's sample	9.39	10.96	2.04	6.64	24.44
687	Inspector's sample	**6.29**	14.15	2.80	6.08	22.59

ANALYSES OF COMMERCIAL FERTILIZERS, SEASON 1906-07.

Laboatory Number	Manufacturer, Place ot Business, and Brand	Phosphoric Acid		Nitgen Per Cent	Potash Per Cent	Valuation
		Available Per Cent	Total Per Cent			
765	Inspector's sample	5.78	13.72	1.83	6.75	19.71
774	Inspector's sample	5.58	15.73	2.08	5.62	18.98
....	Swift's East Texas Trucker—guarantee	8.00	10.00	2.46	3.00	20.47
590	Manufacturer's sample	8.75	10.37	3.10	3.96	24.38
675	Inspector's sample	9.45	11.24	2.58	2 71	22.30
782	Inspector's sample	7.00	10.55	3.14	2.19	20.64
....	Swift's Mandarin Rice Fertilizer—guarantee	10.00	10.50	1.23	1.50	17.44
585	Manufacturer's sample	13.18	14.14	1.52	1.96	22.64
....	Swift's Pure Bone Meal—guarantee	.....	25.00	2.50	.....	26.00
587	Manufacturer's sample	.....	27.67	2.29	.....	27.64
741	Inspector's sample	.....	25.12	3.60	.....	28.17
....	Swift's Pure Special Bone Meal—guarantee	.....	27.50	.82	.....	23.97
589	Manufacturer's sample	.....	30.76	1.48	.....	28.16
....	Swift's Mikado Rice Grower—guarantee	10.00	.....	.....	2.00	14.00
586	Manufacturer's sample	10.64	11.91	.....	4.03	16.80
....	**Tuscarora Fertilizer Co., Chicago, Ill.**					
....	Bone and Potash—guarantee	10.00	11.00	.....	2.00	14.00
491	Manufacturer's sample	11.28	11.74	.....	3.13	16.67
....	High Grade Dissolved Bone—guarantee	14.00	16.09	.....	.....	16.80
495	Manufacturer's sample	15.26	15.76	.....	.....	18.31
744	Inspector's sample	15.56	15.91	.....	.....	18.67
....	Plantation Trucker—guarantee	10.00	11.00	1.65	6.00	23.28
501	Manufacturer's sample	10.06	11.97	1.95	7.54	27.02
742	Inspector's sample	12.82	13.47	1.92	6.02	27.54
....	Standard Cotton Special—guarantee	8.00	9.00	1.65	2.00	16.88
486	Manufacturer's sample	8.33	9.60	2.68	3.29	21.87
....	Tuscarora Monarch—guarantee	9.00	10.00	2.47	3.00	21.70
499	Manufacturer's sample	9.98	11.30	2.74	4.24	24.99
....	Tuscarora Vegetable Special—guarantee	8.00	9.00	3.29	7.00	27.13
623	Manufacturer's sample	9.07	9.52	3.48	7.04	29.06
....	Raw Bone Meal—guarantee	.....	22.00	3.70	.....	26.48
629	*Manufacturer's sample*	.....	*22.81*	*4.06*	.....	*27.99*
	Virginia-Carolina Chemical Co., Shreveport, La.					
....	Royal Fruit Grower—guarantee	8.00	10.00	2.47	5.00	22.50
532	Manufacturer's sample	10.24	13.02	2.72	5.58	26.57
.....	Royal Vegetable Fertilizer—guarantee	8.00	10.00	2.47	4.00	21.50
534	Manufacturer's sample	9.80	12.60	2.78	4.41	25.07
700	Inspector's sample	10.90	13.02	1.72	2.13	20.71
....	Gossypium Phospho Special—guarantee	10.00	12.00	1.65	2.00	19.28
533	Manufacturer's sample	11.28	11.39	2.20	2.81	23.39
683	Inspector's sample	11.04	12.15	1.86	1.83	21.02
....	Royal Blood, Bone and Potash—guarantee	10.00	12.00	1.65	1.50	18.78
562	Manufacturer's sample	11.27	13.41	2.06	2.05	22.16
668	Inspector's sample	11.13	12.60	1.96	1.49	21.11
643	Inspector's sample	11.25	14.07	2.02	1.60	21.56
....	Scott's State Standard Guano—guarantee	8.00	10.00	1.65	2.00	16.88
559	Manufacturer's sample	9.28	10.75	2.12	2.51	20.49
663	Inspector's sample	10.02	11.04	2.02	2.49	20.97
....	Royal Cotton Boll Guano—guarantee	8.00	10.00	1.65	2.00	16.88
557	*Manufacturer's sample*	*8.96*	*12.25*	*1.96*	*2.52*	*19.54*
701	Inspector's sample	10.61	12.11	1.66	2.37	20.41
....	Royal Potash Compound—guarantee	10.00	12.00	.....	4.00	16.00
564	Manufacturer's sample	10.24	11.57	.....	4.52	16.81

Number	Manufacturer, Place of Business, and Brand	Phosphoric Acid		Nitrogen Per Cent	Potash Per Cent	Valuation
		Available Per Cent	Total Per Cent			
4	Inspector's sample	10.35	12.31	.....	2.48	14.90
7	Inspector's sample	12.92	14.26	1.42	1.29	21.33
.	Royal Compound—guarantee	10.00	12.00	.....	2.00	14.00
3	Manufacturer's sample	10.72	12.87	.....	2.33	15.19
4	Inspector's sample	11.35	13.51	.....	1.40	15.02
.	Royal Acid Phosphate—guarantee	12.00	14.00	.....	.....	14.40
8	Manufacturer's sample	15.06	18.12	.....	.....	18.07
3	Inspector's sample	15.86	17.09	.....	.....	19.03
.	V-C-C Co.'s Truck Grower—guarantee	8.00	10.00	2.06	6.00	22.19
4	Manufacturer's sample	9.47	12.29	2.52	6.15	25.57
9	Inspector's sample	10.98	12.96	2.32	2.74	23.34
3	Inspector's sample	11.18	12.59	2.00	4.17	23.98
.	Genuine German Kainit—guarantee	.....	.....	.....	12.00	12.00
1	Manufacturer's sample	.....	.....	.....	12.58	12.58
0	Inspector's sample	.....	.....	.....	11.56	11.56
3	Inspector's sample	.....	.....	.....	10.94	10.94
.	Muriate of Potash—guarantee	.....	.....	.....	48.00	48.00
8	Manufacturer's sample	.....	.....	.....	49.16	49.16
.	Nitrate of Soda—guarantee	.....	.....	.....	15.00	48.00
2	Manufacturer's sample	.....	.....	.....	14.95	47.84
.	Mobile Double Eagle Guano—guarantee	10.00	12.00	1.65	1.50	21.27
1	Manufacturer's sample	10.63	10.87	2.58	2.11	23.99
.	Capital Bone and Potash Compound—guarantee	10.00	12.00	.....	2.00	14.00
5	Manufacturer's sample	10.94	13.23	.....	2.46	15.59
.	Scott's High Grade Acid Phosphate—guarantee	14.00	16.00	.....	.....	16.80
6	Manufacturer's sample	16.25	18.11	.....	.....	19.50
4	Farmer's sample	14.25	15.72	.....	.....	17.10
5	Inspector's sample	13.55	15.44	.....	.....	16.26
.	Royal High Grade Guano—guarantee	10.00	12.00	1.65	1.50	18.78
5	Manufacturer's sample	10.93	13.09	1.94	1.86	21.19
1	Inspector's sample	11.98	13.54	1.54	.35	19.65
2	Inspector's sample	11.71	12.41	2.27	1.93	23.24
.	Scott's Gossypium Phospo—guarantee	10.00	12.00	1.65	1.50	18.78
0	Manufacturer's sample	11.21	11.36	2.28	2.20	23.95
5	Inspector's sample	10.92	12.31	1.65	1.74	20.12
.	V-3-C Fruit and Truck Special—guarantee	6.00	8.00	3.30	8.00	25.76
5	Manufacturer's sample	7.63	10.54	3.30	8.34	28.06
3	Inspector's sample	9.22	10.47	2.28	7.67	26.03
.	Royal Fruit Grower—guarantee	8.00	10.00	2.47	5.00	22.50
2	Manufacturer's sample	10.24	13.02	2.72	5.58	26.57
1	Inspector's sample	11.14	12.37	2.34	4.79	25.61
3	Inspector's sample	9.00	10.24	2.48	6.30	25.14
	Union Meat Company, San Antonio, Texas.					
.	U. M. C. Fertilizer—guarantee	2.80	4.67	7.54	.....	$21.46
5	Manufacturer's sample	2.80	4.67	7.54	.....	21.46
	George A. Wright, Palestine, Texas.					
.	Wright's Corn and Cotton Grower—guarantee	9.07	9.57	2.24	2.54	$20.59
6	Manufacturer's sample	9.07	9.57	2.24	2.54	20.59
3	Inspector's sample	9.17	9.69	2.38	3.66	21.27